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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/806,825 | 03/22/2004 | John D. Bass | 02307V-133910US | 4243 |

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| EXAMINER | |
|---|---|
| MCDONOUGH, JAMES E | |
| **ART UNIT** | **PAPER NUMBER** |
| 1793 | |

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|---|---|
| 12/05/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/806,825 | BASS ET AL. | |
| | Examiner | Art Unit | |
| | James E. McDonough | 1793 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *18 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-48,50-55 and 62-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-48, 50-55, and 62-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 20, 21, 28 and 29 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

"the functional moiety" and "the thermally labile protecting group" lack antecedent basis since there is more than one such group in the composition at these points.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-17, 20-22, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz and Davis, Nature, vol. 403, 20 January 2000, pp. 286-289 (hereafter referred to as Katz) in view of Ki et al., J. Am. Chem. Soc., vol. 124, 2002, pp. 14838-14839 (hereafter referred to as Ki).

Katz discloses the invention as claimed (figure 1; p. 289 "Procedures for imprint cleavage") except for the use of chemical instead thermal of deprotection, however, because Ki teaches how to thermally deprotect imprinted groups from silica, and one skilled in the art would appreciate that thermal deprotection can be done at a lower cost (from use of less reagents) than can be done chemical deprotection with less chemical waste generated in the process, and since this can be used to obtain predictable results, it would have been prima facie obvious to one of ordinary skill in the art at the time of invention to modify the teachings of Katz, by substituting thermal for chemical deprotection, as suggested by Ki, to produce the product at a lower cost with less waste materials generated, while achieving predictable results.

Regarding claims 10 and 13-15

Katz lacks explicit disclosure that the inorganic oxide may have a planar surface or that the thermolysis may occur at higher temperatures. However, it is conventional in the art to have planar inorganic oxide surfaces, and it would have been well within the skill of the routineer in the art to perform the thermolysis step at an elevated temperature. It would have been obvious to one of ordinary skill in the art to apply that

skill to the disclosure of Katz with a reasonable expectation of obtaining a highly-useful method of making an inorganic oxide imprinted with functional groups and the oxide itself with the expected benefit of the oxide being processable at a range of temperatures depending on the temperature required to cleave the linking group.

Claims 18, 19, 23-27, 30-33, 45-48, and 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz and Davis, Nature, vol. 403, 20 January 2000, pp. 286-289 (hereafter referred to as Katz) in view of Ki et al., J. Am. Chem. Soc., vol. 124, 2002, pp. 14838-14839 (hereafter referred to as Ki) as applied to claim1-17, 20-22, 43, and 56-58 above, and further in view of Dai et al., USP 6,251,280 (hereafter referred to as Dai II).

Katz lacks explicit disclosure that a mixture of different ligands may be used to imprint the inorganic oxide. However, Dai II teaches that a variety of such ligands may be used for this purpose (col. 9, 1. 27 to col. 10, 1. 8).

It would have been obvious to one of ordinary skill in the art to apply the teaching of Dai II to the disclosure of Katz with a reasonable expectation of obtaining a highly-useful method of making an imprinted inorganic oxide material and the material itself with the expected benefit of the material having more than one species of binding surface.

Claims 34-42, 44, 62-66, and 68-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz and Davis, Nature, vol. 403, 20 January 2000, pp. 286-289 (hereafter referred to as Katz) in view of Ki et al., J. Am. Chem. Soc., vol. 124, 2002, pp. 14838-14839 (hereafter referred to as Ki) in further view of Dai et al., USP 6,251,280 (hereafter referred to as Dai II) as applied to claims 1-27, 30-33, 43, 45-48, and 50-55 above, and further in view of Wulff, Chemical Reviews, vol. 102, number 1, Jan 2002 (hereafter referred to as Wulff).

The reference teach the use of multiple functional moieties per imprint up to three, but none of the references disclose the use of more than three, however, because Wulff teaches synthetic polymers (silica) having up to four moieties per imprint (scheme 1, figure D), and one skilled in the art would appreciate that the number and type of moiety to be imprinted can be adjusted to achieve specific characteristics of the final product, it would have been prima facie obvious to someone of ordinary skill in the art at the time of invention to modify the primary references to include four moieties per imprint, to change the properties of the imprinted site in a predictable way, to increase its specificity for certain guest molecules.

**Response to Arguments**

Applicants arguments have been fully considered but are moot in light of the new rejections.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James E. McDonough whose telephone number is (571)272-6398. The examiner can normally be reached on 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JEM 12/2/2007

J. A. LORENGO
SUPERVISORY PATENT EXAMINER